Sheridan, Byron, Fox, Pitt, Gustavus Adolphus, Wellington, and George Canning. At twenty-six our future Lord Stratford helped to found the *Quarterly Review*, and introduced Gifford to Murray. —— Messrs. Fords, Howard, & Hulbert (New York) announce for publication 'The Democratic Party: its History and Influence' (new third edition, revised to date); and 'Tenants of an Old Farm,' an illustrated work on insect-life, by Dr. Henry C. McCook, hitherto sold at $2.50, sold this season at $1.50. —— William R. Jenkins (New York) announces 'Paul Bercy's Works,' for the study of French by the natural method; 'La Langue Française;' 'La Langue Française' (seconde partie); 'Livre des Enfants,' *pour l'étude du Français*, a primer full of illustrations, which serve as object-lessons for the youngest children; 'Le Second Livre des Enfants' (just published), intended for children also. It is full of illustrations, and, like the first book, these form the basis upon which the text is arranged, rendering it attractive in every way to children who have mastered the first book. —— The Burrows Brothers Company (Cleveland, O.) announces 'Christian Science, its Truths and Errors,' by the Rev. H. Melville Tenney; and 'The Pocket Gem Pronouncing Dictionary,' by Lilla M. Tenney, on a new plan. —— The Century Company announces 'Ranch Life and the Hunting-Trail,' by Theodore Roosevelt. —— 'Principles of the Economic Philosophy of Society, Government and Industry,' by Van Buren Denslow, LL.D., has just been published by Cassell & Co. This firm continues its 'National Library,' edited by Prof. Henry Morley, LL.D., a series of weekly volumes of reprints of standard works.

NOTES AND NEWS.

THE New York Academy of Science held its opening meeting Oct. 1. By the election of Professor Fairchild to the chair of natural history at the University of Rochester, the academy has lost one of its most active members, — a loss which will be felt for a long time to come. The publications of the academy have been pushed forward most energetically, and the active editor, Professor Martin, has succeeded in bringing them up to date, their value being thus greatly enhanced. Mr. George F. Kunz sent in an interesting paper on recent mineralogical discoveries, and several members reported on the results of journeys undertaken during last summer's vacation. Dr. H. Carrington Bolton made some interesting remarks on German and Austrian libraries which he had visited in pursuance of bibliographical studies, and dwelt on the defects of the systems of several of these libraries. On the other hand, he described the management of the library of Strassburg as worthy of the highest commendation. The arrangement is thoroughly systematical. Visitors are allowed the greatest possible facilities, and any citizen of Alsace Lorraine applying for books is entitled to have them sent to his house, whether he lives in Strassburg or in some other part of the province. Dr. Brinton gave a brief description of his studies in English collections and libraries, and noted a large collection from Bolivia which is said to contain an unexpectedly large number of species and genera unknown to science. After a brief discussion of the trap rocks of Pennsylvania and New York, Dr. F. Boas gave a sketch of the ethnological results of his journey to British Columbia, during which he visited most of the peoples of that province.

—The committee on publications and lectures, of the Massachusetts Society for promoting Good Citizenship, have issued a circular requesting the clergymen of Massachusetts to prepare and preach, and as far as possible publish, between now and the general election in November, at least one sermon on the duties and responsibilities of American citizenship.

—A study undertaken by W. von Bezold a number of years ago made it probable that thunder-storms have a period corresponding to that of the rotation of the sun. In his inquiry he had used the material collected at the meteorological stations of Bavaria. As, however, an influence of this kind seemed very improbable, he did not publish the results of his researches. Recently Hertz, Wiedemann, Arrhenius, and others have shown that by the influence of radiation the conductivity of the air is changed, and thus a period of the frequency of thunder-storms corresponding to that of the rotation of the sun does not appear improbable. For this reason Von Bezold has taken up his earlier researches, and carefully scrutinized the observations of thunder-storms in Bavaria and Wurtemberg from 1880 to 1887. The *Naturwissenschaftliche Rundschau* reports on a paper on this subject read by Von Bezold before the Berlin Academy of Science. He finds that a period exists; and the proofs he gives are so convincing, that he feels encouraged to pursue this subject more fully.

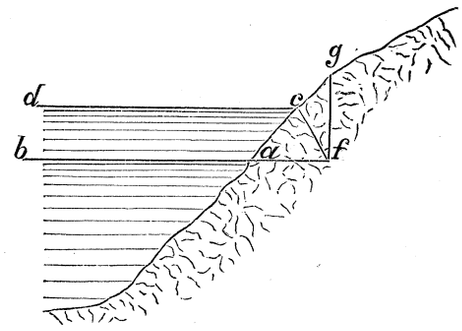
LETTERS TO THE EDITOR.

Floods in the Lower Mississippi.

MAJOR POWELL, in his letter to the New Orleans Chamber of Commerce, suggests as a means of regulating the lower Mississippi the erection of large basins at the head waters of its tributaries in the Rocky Mountains. "The cutting-power of a stream," he says, "increases rapidly with an increase of sedimentary load."

If this be correct, then there must be an increase in either quantity or in velocity by the increasing sedimentary load, those two constituting the working energy of the water, which is: quantity times half the square of the velocity. As to the quantity, there is, in fact, an increase. Draw a cubic foot of water from the river and let it rest. The sediment will settle to the bottom, and is therefore heavier than the amount of water it displaces, as otherwise it would remain in suspension. For this reason a cubic foot of water mixed with sediment is heavier than a cubic foot of clear water.

But how is it that this same sediment was in suspension in the same water when it was in the river? Because the water there had velocity. Velocity has an equivalent in 'head' or water weight



and just as much of this head will be used to carry along the surplus weight of the sediment as is equivalent to this surplus. Diminished head is diminished velocity. Clear water, therefore, will flow quicker (that is, have more working energy) than water mixed with sediment, which will readily be seen when we imagine such an amount of sediment to be added to the water that it would attain the consistency of sirup.

If, now, as Major Powell claims, the product of the two is increased by the increase of sediment, then the gain in weight of the quantity ought to be greater than the loss in velocity. This is not likely, for the reason that the velocity in that product is squared, and every loss in it, therefore, is squared too. It is furthermore not likely, because every gain in weight creates an additional loss in head, part of the latter being used to crush and pulverize the increase of sediment from heavy bowlders in the mountains into fine sand at the mouth of the river. There is only one grand total of power corresponding to a certain head, and every deduction from it is a loss which cannot be made up for again.

The indisputable fact that rivers choked by sediment do more lateral cutting than cleaned rivers, therefore, does not seem to be exactly expressed by attributing this fact to an increase in cutting-power of the water through sediment. If it is, Major Powell should prove it.

Again the letter reads, "The waters of the Missouri come loaded with materials which go on cutting and grinding with constantly increasing energy in their journey to the sea, choking the channel and cutting away the land." I should like to see this sentence more fully explained, as I fail to understand its full meaning.

As a matter of fact, there are other causes besides the action of sediment which increase the amount of river-sediment by bank-

cutting, but the crumbling of banks to a large extent is caused by the dissolving-power of water. Loam, clay, and silt as a rule largely constitute the banks of rivers. Water coming into contact with loam at a point *e* will destroy its cohesion, and carry it away. The water falling from level (*e d*) to *a b* eats into the bank as far as *f*, and the whole body (*f e g*), deprived of its support, will tumble down into the river as soon as it is sufficiently heavy to overcome the cohesion along *g f*; this irrespective of any sediment being mixed with the water, as pure water will destroy the cohesion of those materials in exactly the same way as water loaded with sediment.

The same effect is produced by frost. If bank-material saturated with water freezes up, its cohesion is destroyed. The spring freshets will carry it away.

Another instance of this kind is a bank consisting of layers resting on an inclined clay seam. When for some reason the seam becomes exposed to water, this will moisten its surface and transform it into a slippery mass, thus causing the overlying strata to slide into the river.

Therefore, suppose the head waters of all the tributaries of the Mississippi to furnish an entirely clear supply of water. It enters the river-channel. Immediately it picks up such sediment as its velocity enables it to carry. More sediment is added by the causes presented, — the old condition!

There are other remedies of long-established repute, which, if not by the same constructions, in principle certainly, will be just as practical here as anywhere else.

"The prime end to be sought," so Major Powell correctly puts it, "in order to prevent destructive floods, is to prevent the choking of the channel;" and again, "The real problem is to relieve the river of its excess of sediment." In these views engineers will fully concur. The letter touches upon one of these remedies: "Much of a coarser sediment is left to add to the geological growth of the region, while vast quantities pass on to the sea." The end to be sought, then, is to reverse this condition, and make the vast quantities add to the geological growth of the region. This can be accomplished by fixing, protecting, and in that way solidifying, large deposits which are now in constant migration, and preventing their being transformed again into floating sediment. To this end force the river into a channel, which removes the deposits from the current.

The sediment contributed by the tributaries now is only a trifle as compared with the amount centuries have accumulated in the beds of the Missouri and Mississippi. To make these enormous quantities *terra firma* is more effective than to clean the mountain waters, because the effect will be felt right there where the work is done, and at once.

Another means of making the sediment add to the geological growth of the region is this: Create a strip of 'dead' water on both banks all along the entire extent of the rivers in open and direct connection with the current. There will be a constant exchange of water between the current, where the water is loaded with sediment, and these bodies of standing water; and whatever water from the current gets into this strip will deposit its sediment. Then it returns into the river, is reloaded with detritus, and reenters the strip of standing water. Thus a destructive agency will be turned into a useful tool, carrying along sediment to add to the geological growth of the region. In course of time this strip will be completely filled, and then the water will not only flow in a concentrated channel, but there will also have been formed a terrace at the foot of the old bank, which protects it. This is the really effective settling-basin, and the thousands of miles of river-banks are the places where they must be constructed, because they do the work right on the spot where it is needed.

JULIUS MEYER, C.E.

Cleveland, O., Sept. 18.

Chalchiuitl: A Note on the Jadeite Discussion.

THE jadeite discussion is evidently not yet terminated. In the *American Anthropologist* for July, 1888, Dr. A. B. Meyer of Dresden maintains his position "that the nephrite (jadeite) question is not an ethnologic problem," the mineral occurring wherever the *artefacts* from it are found; while at the recent meeting of the American Association for the Advancement of Science, August, 1888, Prof. F. W. Putnam of Cambridge reiterated his belief, already expressed in the reports of the Peabody Museum, that the specimens of jadeite from Mexico and Central America were originally brought from Asia.

Jade first became known to modern Europeans by the specimens brought from Mexico, as the origin of the name attests (Spanish, *piedra de ijada*, so called from its supposed virtues in colic, *mal de ijada*), and therefore the references to it in the early writers on Mexico merit special attention. These have been partly collated by E. G. Squier, in his 'Observations on a Collection of Chalchihuitls' (*Annals of the Lyceum of Natural History*, New York, 1869), and later by Professor Fischer in his well-known volume 'Nephrit und Jadeit.' In verifying these quotations, I find that some important authorities have been altogether omitted, and others only partially reported. No direct reference is made to the Codex Mendoza; and Squier omits some of the most important observations of Sahagun, to wit, those referring to the *provenance* of these minerals, — the very point which, in the present stage of the question, we wish light upon. The practical bearing of this point will be readily appreciated when I add that the statement was made at the meeting of the American Association in August, that last winter an expert was sent to Mexico at considerable expense for the sole purpose of discovering the locality of the jadeite, but his search was vain.

The Nahuatl (Mexican) name for jadeite is *chalchiuitl*. This appears to have been applied to any greenish, partially transparent stone capable of receiving a handsome polish. All such were highly esteemed. Specific distinctions were established between such precious minerals by descriptive adjectives, as follows: —

Iztac chalchiuitl, white chalchiuitl; of a fine green, quite transparent, without stripes or stains.

Quetzal chalchiuitl, precious chalchiuitl; white, much transparency, with a slight greenish tinge, somewhat like a jasper.

Tlilayotic, literally, 'of a blackish watery color;' with mingled shades of green and black, partially transparent (chlormelanite?).

Tolteca-iztli, literally 'Toltec knife,' or 'Toltec obsidian;' of a clear, translucent green, and 'very beautiful.'

These are the descriptions of Bernardino de Sahagun (*Historia de la Nueva España*, Lib. XI. cap. 8), probably the source of all other writers upon this subject. He is not very exact as to the localities in which they were found by the natives. The first-mentioned, however, the white chalchiuitl, he states was obtained from quarries in the vicinity of Tecalco. This town, which I do not find on late maps, was in the state of Puebla, and it may be the modern Tecali mentioned by Orozco y Berra in that state (*Geografia de las Lenguas Indijenas de Mejico*, p. 211). It would be worth while searching in that vicinity.

With reference to the last-mentioned variety, the Toltec stone, Sahagun makes a noteworthy remark, not quoted by Squier, which, so far as it goes, is certainly in favor of the view that this valued variety was not from any deposit known to the natives. This beautiful species of chalchiuitl, he says, did at one time exist in this country (New Spain), "and does yet, *as is proved by the pieces obtained from the ancient edifices.*" In other words, no deposit was known to the natives of his day, and such fragments as they possessed were exhumed from the ruins of the ancient cities.

The Codex Mendoza is a copy of the tribute-roll of the ancient Mexican Empire (published in LORD KINGSBOROUGH'S *Mexican Antiquities*). It defines the tax from each district, naming the cities. Strings of chalchiuitl are mentioned as part of the tribute from a number of localities, and refer evidently to small rounded pieces used as beads, and obtained from the sands of streams. Only from one district are large pieces of chalchiuitl demanded. These, three in number each year, were required from Tototepec, Chinantlan, and other towns situate in the present state of Oaxaca, and principally in the department of Vilalta (Zoochila). Mühlenpfordt describes this region as mountainous and wild, inhabited by the Mixe Indians and the Chinantecas (*Schilderung der Republik Mejico*, Bd. II. s. 213, 214). This is the spot to which the explorer should penetrate if he would discover the locality of the large pieces of Mexican jadeite.

D. G. BRINTON.

Media, Penn., Sept. 28.